

### **REMARKS/ARGUMENTS**

Reconsideration of this application is requested. Claims 1-24 remain pending in the application subsequent to entry of this Amendment.

At the outset applicants are pleased to note that claims 14 and 15 are objected to as depending from a rejected claim but are otherwise allowable. For the reasons that will be explained in further detail, applicants submit that all pending claims in this application are allowable.

#### **Discussion of Amendments to the Claims**

The claims have been amended in order to more particularly point out and distinctly claim that which applicants regard as their invention and to conform them to local practice, for instance deleting parenthetical expressions, changing "characterized in that" to --wherein-- and to use appropriate Markush terminology when groups of components are being listed and claimed.

Claim 19 is amended to remove mention of a trademark as noted in the comments that follow.

#### **Preliminary Overview**

After careful study of the Official Action applicants note that several documents are cited and applied to the originally filed claims which disclose compositions containing halogens. One of the characterizing features of the present invention is that the claimed polycarbonate compositions are halogen-free compositions, so it is not seen how the compositions which contain halogen are pertinent to those that are halogen-free.

Response is now provided to the issues raised in the outstanding Official Action in the order presented.

#### **Provisional Non-Statutory Obviousness-Type Double Patenting**

The Examiner makes reference to another US patent application, i.e. US Serial No. 11/628,617 in the name of the same Applicant, with reference to double patenting arguing the ingredients are "similar" and the "concentrations overlap". This is not so. Applicants draw the examiner's attention to the fact that SN 11/628,617 relates to a polyester flame retarded composition, while the present application relates to polycarbonate flame retarded compositions.

Polycarbonates are polymers having functional groups linked together by carbonate

groups (-O-(C=O)-O-) in a long molecular chain, while Polyester is a category of polymers which contain the ester functional group (-O-(C=O)-) in their main chain. Although there are many polyesters, the term "polyester" as a specific material most commonly refers to polyethylene terephthalate (PET). It is evident that polyesters and polycarbonates have different functional groups and cannot, in any way, be confused. So, the two inventions relates to very different compounds and compositions and nothing have in common.

The provisional "double patenting" objection should be withdrawn.

Claim Rejection - 35 USC §112

The Examiner objected that claim 5 fails to comply with the enablement requirement. However, description of the present application, paragraphs [0031]<sup>1</sup> and [0041]<sup>2</sup>, give all the necessary information in order to allow the skilled man to understand the meaning of the wording used. Therefore, applicants submit that the average molecular weight as cited in the present application, is well supported by the content of the application as filed.

Claim 19 has been amended to delete the trade name from the claim.

Claim Rejection - 35 USC §102

US 3,833,537 (Jaquiss) discloses a thermally stable polycarbonate composition which is stabilized (with respect to thermal degradation) through the presence of a particular salt of hypophosphorous acid. The object of the disclosed invention is to provide a thermal-oxidatively stable polymeric composition (column 1, lines 61-62). The amount of the salt that may be employed can vary from 0.0005 to about 2.0 weight percent. The salts of hypophosphorous acid which can be employed are, among the others, calcium hypophosphite (column 2, lines 6-13).

Preferred embodiments, as described in examples I to IV, show that the percentage of hypophosphorous acid salt are 0.03, 0.01, 0.01, sometimes mixed together a particular epoxy compound (column 2, lines 26-66). It is disclosed a completely different use of the hypophosphorous acid salt, and examples are given accordingly, demonstrating that polycarbonate specimens are heat aged for seven days (example VII), in order to demonstrate the hypophosphorous acid salt's action as a thermal-oxidatively stabilizer for polycarbonates.

US 2003/0171494 (Aramaki) discloses block copolymer comprising at least two kinds of

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<sup>1</sup>, <sup>2</sup> Related to US-2007-0082995-A1, the published version of the subject application.

polymer components each having a different structural unit in the polymer, where the polymer components are selected from, for example, polycarbonate and polyester (page 1, [0011]). Also disclosed is a process for producing a block copolymer, which comprises melt kneading at least two kinds of polymer components each having a different structural unit in the polymer with a phosphite ester compound and a phosphite metal salt (page 2, [0023]). The phosphite metal salt includes metal salts of phosphorous acid and hypophosphorous acid with metals such as for example calcium (page 8, [0090; 0091]). The phosphite metal salt works as reaction catalyst, and the final product is a copolymer between at least two polymer components having different structural units.

JP 51059946 (TEIJIN LTD) discloses a resin composition comprising:

- 1) a flame retardant agent for example polybromobiphenyl, hexabromobenzene etc.
- 2) an alkaline earth metal salt (Mg, Ca, Ba, etc.) of hypophosphorous acid. The resin can be polycarbonate (*see abstract*).

CA 1219390 (BAYER) discloses a thermoplastic moulding composition of an aromatic halogen containing polycarbonate, a thermoplastic copolymer containing nucleus-alkylated styrene and an ABS graft copolymer (page 1, lines 3-7). The described compositions are self-extinguishing if the aromatic polycarbonate contains halogen and the thermoplastic copolymer contains nucleus-alkylated styrene in copolymerized form (page 2, lines 8-14). Suitable organic halogen-containing compounds are flameproofing agents listed at page 7, lines 29-35, page 8, lines 1-5.

US 5,061,745 (WITTMANN) discloses high impact, flame-retardant thermoplastic polycarbonate molding compounds consisting of several components, particularly components A), B), D), E) being essential (column 1, claim 1). Component E) is a tetrafluoroethylene polymer.

The present application US 2007/0082995 relates to halogen free flame retarded polycarbonates and a process for their preparation [001]. One of the objects of the present invention is to provide halogen-free flame retarded moulded articles ranking Vo, according to the UL 94 classification, able to give raise to moulded articles characterized by a very low thickness, for example about 1.5 mm, which maintain high thermal stability during processing, low phenol emission, high degree of retention of mechanical properties and good weather resistance [0012].

According to the present invention, it has been surprisingly found that hypophosphorus acid metal salts, with particular reference to the commercially available calcium hypophosphite and aluminium hypophosphite, are very effective flame retardant agents for polycarbonate based thermoplastic moulding compositions. The hypophosphorus acid metal salts according to the present invention do not need the presence of any halogen containing compounds in order to achieve their flame retardant activity. Therefore, prior art documents disclosing halogen-containing compositions cannot be in any way related to the present invention.

In fact, the present invention relates to an halogen free flame retarded composition based on polycarbonates that constitutes an alternative for the well known halogen based flame retardant containing system [0001-0002].

From the experimental data reported in the application as filed, it is evident that the formulations according to the present invention allow one to use a lower amount of flame retardant agent with respect to the amount of flame retardant agent used in the formulations according to the prior art, in order to achieve the same best technical effect.

This is a surprising technical result that is achieved with the compositions according to the present invention and that couldn't be derived from the prior art teaching.

In view of the above, it is evident that the technical problem is not merely the provision of further polycarbonate compositions, but also to provide novel polycarbonate compositions with an improved flame retardant performance with respect to corresponding formulations according to the prior art.

In fact, according to the present invention, the new formulations according to the present invention, allow to reach the same rank (Vo) using a different amount/ratio of flame retardant additives.

For the above reasons it is respectfully submitted that claims 1-13 and 16-24 are also in condition for allowance as are claims 14 and 15 as the examiner has kindly acknowledged.

Reconsideration and allowance are solicited. Should the examiner require further information, please contact the undersigned.

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Respectfully submitted,

**NIXON & VANDERHYE P.C.**

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